

CLAIMS

1. A method for a treating virus-containing sample, characterized by treatment of a virus-containing sample with a treatment solution containing (1) an anionic surfactant and (2) an amphoteric surfactant, nonionic surfactant or protein denaturant.

2. A method for treating a virus-containing sample, characterized by treatment of a virus-containing sample with a treatment solution containing (1) an anionic surfactant, (2) an amphoteric surfactant and (3) a nonionic surfactant or protein denaturant.

3. A method for treating a virus-containing sample, <sup>comprising</sup> ~~characterized by treatment~~ of a virus-containing sample with a treatment solution containing (1) an anionic surfactant, (2) an amphoteric surfactant, (3) a nonionic surfactant and (4) a protein denaturant.

4. <sup>The</sup> ~~A method according to any one of claims 1 to 4,~~ wherein said treatment solution further contains urea, an imidazole ring-containing compound or an indole ring-containing compound.

5. A method according to claim 4, wherein said imidazole ring-containing compound is imidazole, histidine, imidazoleacrylic acid, imidazolecarboxyaldehyde, imidazolecarboxamide, imidazoledione, imidazoledithiocarboxylic acid, imidazoledicarboxylic acid, imidazolemethanol, imidazolidinethione, imidazolidone, histamine or imidazopyridine.

6. A method according to claim 4, wherein said indole ring-containing compound is tryptophan, indoleacrylic acid, indole, indoleacetic acid, indoleacetic hydrazide, methyl indoleacetate, indolebutyric acid, indoleacetonitrile, indolecarbinol, indolecarboxyaldehyde, indolecarboxylic acid, indoleethanol, indolelactic acid, indolemethanol, indolepropionic acid, indolepyruvic acid, indolyl methyl ketone, indomycin, indoleacetone, indomethacin,

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indoprofen or indolamine.)

7. A method for treating a virus-containing sample, <sup>comprising</sup> ~~characterized by~~ treatment of a virus-containing sample with a treatment solution containing (1) a chaotropic ion and (2) an acidifying agent.

8. A method for treating a virus-containing sample, characterized by treatment of a virus-containing sample with a treatment solution containing (1) a chaotropic ion, (2) an acidifying agent and (3) a nonionic surfactant.

9. <sup>AS in claim 13</sup> ~~A method according to any one of claims 1 to 8,~~ wherein said virus is a virus which forms virus particles having a structure comprising a structural protein encapsulating genomic RNA or DNA and a membrane protein or lipid membrane surrounding it.

10. A method according to claim 9, wherein said virus is hepatitis C virus (HCV), hepatitis D virus, hepatitis E virus, hepatitis G virus, hand-foot-and-mouth disease virus, a flavivirus (yellow fever virus, West Nile virus, Japanese encephalitis virus, dengue virus), a togavirus (alpha-virus, rubivirus, arterivirus, rubella virus), a pestivirus (hog cholera virus, bovine diarrhea virus), a paramyxovirus (parainfluenza virus 1, 2, 3, 4, canine distemper virus, Newcastle disease virus, RS virus, rinderpest virus, simian parainfluenza virus, measles virus, mumps virus), an orthomyxovirus (human influenza virus, avian influenza virus, equine influenza virus, swine influenza virus), a rhabdovirus (rabies virus, vesicular stomatitis virus), a picornavirus (poliovirus, Coxsackie virus, echovirus, bovine enterovirus, porcine enterovirus, simian enterovirus, mouse encephalitis virus, human rhinovirus, bovine rhinovirus, equine rhinovirus, foot and mouth disease virus, hepatitis A virus), a coronavirus (human coronavirus, avian infectious bronchitis virus, mouse hepatitis virus, porcine transmissible gastroenteritis virus), an arenavirus (lymphocytic choriomeningitis

| Year | Number of people (millions) |
|------|-----------------------------|
| 1970 | 75                          |
| 1980 | 95                          |
| 1990 | 115                         |
| 2000 | 130                         |
| 2005 | 120                         |
| 2010 | 110                         |
| 2015 | 100                         |

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16. A kit, assay kit or diagnostic reagent for determining the presence or absence of a virus in a sample, which is for use in an immunoassay method according to claim 12 and comprises a monoclonal antibody according to claim 14.

17. A kit, assay kit or diagnostic reagent for determining the presence or absence of a virus in a sample, which is for use in an immunoassay method according to claim 12 and comprises a chaotropic agent.

18. A kit, assay kit or diagnostic reagent for determining the presence or absence of HCV in a sample, which is for use in an immunoassay method according to claim 12 and comprises a monoclonal antibody produced by hybridoma HC11-14 (FERM BP-6006), HC11-10 (FERM BP-6004) or HC11-11 (FERM BP-6005).

19. A diagnostic kit according to any one of claims 15 to 17 which further includes urea, an imidazole ring-containing compound or an indole ring-containing compound.

20. A diagnostic kit according to claim 19, wherein said imidazole ring-containing compound is imidazole, histidine, imidazoleacrylic acid, imidazolecarboxyaldehyde, imidazolecarboxamide, imidazoledione, imidazoledithiocarboxylic acid, imidazoledicarboxylic acid, imidazolemethanol, imidazolidinethione, imidazolidone, histamine or imidazopyridine.

21. A diagnostic kit according to claim 19, wherein said indole ring-containing compound is tryptophan, indoleacrylic acid, indole, indoleacetic acid, indoleacetic hydrazide, methyl indoleacetate, indolebutyric acid, indoleacetonitrile, indolecarbinol, indolecarboxyaldehyde, indolecarboxylic acid, indoleethanol, indolelactic acid, indolemethanol, indolepropionic acid, indolepyruvic acid, indolyl methyl ketone, indomycin, indoleacetone, indomethacin, indoprofen or indolamine.

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22. A virus assay method <sup>comprising</sup> ~~characterized by~~ measurement of a virus antigen based on its binding with a probe in the presence of a surfactant with an alkyl group of 10 or more carbon atoms and a secondary, tertiary or quaternary amine, or a nonionic surfactant with a hydrophilic/lipophilic balance (HLB) of 12-14.

23. A method <sup>as in</sup> ~~according to~~ claim 22, wherein said surfactant ~~having an~~ alkyl group and a secondary, tertiary or quaternary amine is a surfactant with an alkyl group of 10-20 carbon atoms and a tertiary or quaternary amine.

24. A method according to claim 22 or 23, wherein said tertiary or quaternary amine surfactant is dodecyl-N-sarcosinic acid, a cetyl or dodecyltrimethylammonium salt, 3-(dodecyldimethylammonio)-1-propanesulfonic acid, a dodecylpyrimidium salt or decanoyl-N-methylglucamide (MEGA-10).

25. A method according to either of claims 23 or 24, wherein said nonionic surfactant is polyoxyethylene isooctyl phenyl ether or polyoxyethylene nonyl phenyl ether.

26. A method <sup>as in claim 22</sup> ~~according to any one of claims 22 to 25,~~ wherein said virus antigen probe is an antibody for the virus antigen.

27. A method <sup>as in claim 22</sup> ~~according to any one of claims 22 to 26,~~ wherein said virus is a virus which forms virus particles having a structure comprising a structural protein encapsulating genomic RNA or DNA and a membrane protein or lipid membrane surrounding it.

28. A method according to claim 27, wherein said virus is hepatitis C virus (HCV), hepatitis D virus, hepatitis E virus, hepatitis G virus, hand-foot-and-mouth disease virus, a flavivirus (yellow fever virus, West Nile virus, Japanese encephalitis virus, dengue virus), a togavirus (alpha-virus, rubivirus, arterivirus, rubella virus), a pestivirus (hog cholera virus, bovine diarrhea virus), a paramyxovirus (parainfluenza virus 1, 2, 3, 4,

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canine distemper virus, Newcastle disease virus, RS  
virus, rinderpest virus, simian parainfluenza virus,  
measles virus, mumps virus), an orthomyxovirus (human  
influenza virus, avian influenza virus, equine influenza  
virus, swine influenza virus), a rhabdovirus (rabies  
virus, vesicular stomatitis virus), a picornavirus  
(poliovirus, Cocksackie virus, echovirus, bovine  
enterovirus, porcine enterovirus, simian enterovirus,  
mouse encephalitis virus, human rhinovirus, bovine  
rhinovirus, equine rhinovirus, foot and mouth disease  
virus, hepatitis A virus), a coronavirus (human  
coronavirus, avian infectious bronchitis virus, mouse  
hepatitis virus, porcine transmissible gastroenteritis  
virus), an arenavirus (lymphocytic choriomeningitis  
virus, lassa virus, Korean hemorrhagic fever virus), a  
retrovirus (HTLV: human adult leukemia virus, HIV: AIDS  
virus, feline leukemia sarcoma virus, bovine leukemia  
virus, Rous sarcoma virus), a reovirus (rotavirus), a  
calciavirus (Norwalk virus), a bunyavirus (renal syndrome  
hemorrhagic fever virus), a phyllovirus (Ebola virus,  
Marburg virus), hepatitis B virus (HBV), a pox virus  
(vaccinia virus, alastrim virus, cowpox virus, smallpox  
virus), a parvovirus (human parvovirus, porcine  
parvovirus, bovine parvovirus, canine parvovirus, feline  
leucopenia virus, Aleutian mink disease virus), a  
papovavirus (papilloma virus, polyoma virus), adenovirus,  
a herpes virus (herpes simplex virus, cytomegalovirus,  
chickenpox herpes zoster virus, EB virus, equine herpes  
virus, feline herpes virus, Marek's disease virus) or  
African swine cholera virus.

29. A method according to <sup>AS in claim 22</sup> ~~any one of claims 22 to~~  
28, wherein said virus is hepatitis C virus (HCV) or  
hepatitis B virus (HBV).

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